

**Commonwealth of Kentucky
Division for Air Quality**

PERMIT APPLICATION SUMMARY FORM

Completed by: Hossein Rakhshan

GENERAL INFORMATION:

Name:	Electro Cycle, Inc.
Address:	230 Baldwin Drive Madisonville, KY 42431
Date application received:	April 16, 2008
SIC/Source description:	3355/ Secondary Aluminum Production Plant
Source I. D. No.:	021-107-00121
Source AI No.:	APE20080001
Activity No.:	1880
Permit number:	V-05-050 R2

APPLICATION TYPE/PERMIT ACTIVITY:

<input type="checkbox"/> Initial issuance	<input type="checkbox"/> General permit
<input checked="" type="checkbox"/> Permit modification	<input type="checkbox"/> Conditional major
__Administrative	<input checked="" type="checkbox"/> Title V
__Minor	<input checked="" type="checkbox"/> Synthetic minor
_X_Significant	<input type="checkbox"/> Operating
<input type="checkbox"/> Permit renewal	<input checked="" type="checkbox"/> Construction/operating

COMPLIANCE SUMMARY:

<input type="checkbox"/> Source is out of compliance	<input type="checkbox"/> Compliance schedule included
<input checked="" type="checkbox"/> Compliance certification signed	

APPLICABLE REQUIREMENTS LIST:

<input type="checkbox"/> NSR	<input type="checkbox"/> NSPS	<input checked="" type="checkbox"/> SIP
<input type="checkbox"/> PSD	<input checked="" type="checkbox"/> NESHAPS	<input type="checkbox"/> Other
<input type="checkbox"/> Netted out of PSD/NSR	<input type="checkbox"/> Not major modification per 401 KAR 51:017, 1(23)(b) or 51:052,1(14)(b)	

MISCELLANEOUS:

- ☐ Acid rain source
- ☐ Source subject to 112(r)
- ☐ Source applied for federally enforceable emissions cap
- ☐ Source provided terms for alternative operating scenarios
- ☒ Source subject to a MACT standard
- ☐ Source requested case-by-case 112(g) or (j) determination
- ☐ Application proposes new control technology
- ☒ Certified by responsible official
- ☐ Diagrams or drawings included
- ☐ Confidential business information (CBI) submitted in application
- ☐ Pollution Prevention Measures
- ☐ Area is non-attainment (list pollutants):

EMISSIONS SUMMARY:

Pollutant	Potential (tpy)	Actual (tpy)
PM/PM10	325	15
SO ₂	35.5	35.5
NO _x	8.8	8.8
VOC	180	0.54
CO	0.7	0.7
Hydrochloric Acid	0.7	0.7
Chromium Compound	0.0023676	0.0023676
Dioxin/Furans	0.0000002	0.0000002
Toluene	0.189	0.189
Vinyl Chloride	0.319	0.319

SOURCE PROCESS DESCRIPTION:

Electro Cycle, Inc. (Electro Cycle) is a secondary aluminum alloy ingots production plant. The source is located in Madisonville, KY and produces alloy ingots for the metal casting industry. The source melts and alloys a variety of recycled aluminum products to produce these ingots. The transforming of recycled aluminum scrap into alloy ingot at the source is a four-step process. These steps are: scrap receiving, scrap shredding, delacquering kiln (kiln) processing and induction furnace melting.

The source melts several types of scrap in the induction furnace. These include industrial scrap from can manufacturers that arrives densified either in a bale or a briquette. The source also processes loose extrusion turnings, wheel turnings and can process scrap forms, i.e. extrusion scrap, wheels, etc. Dealer scrap is the only scrap material fed into the kiln that contains the contaminants required for D/F formation. Most material used to make up the charge to the induction furnace is in the form of densified bales or briquettes. This material must be processed further, before it is ready to charge into the induction furnace. This processing begins at the #1 mill (Mac/Saturn-low speed-high torque mill) with 3 100 HP motors in tandem that drive the 2 hydraulic motors. The scrap is conveyed up and into the #2 mill (American Pulverizer-300 HP ring mill) for further sizing. Ferrous scrap is then removed magnetically and the milled scrap is conveyed to the kiln where the organic coatings are thermally removed and passed into the afterburner for ultimate destruction. The afterburner oxidizes the unburned hydrocarbon vapors in the gas stream that is vented from the kiln. The source uses a electrically operated induction furnace to provide the thermal energy to melt the aluminum scrap. The induction furnace has a capacity of 7 tons. Material is charged from the kiln to the induction furnace and the molten metal is poured into sow molds for solidification.

The particulate, acid gas and D/F emissions from the kiln are controlled by a baghouse that uses lime and activated carbon coated bags for additional acid gas and D/F control. The manufacturer specified

particulate control efficiency is 99.3% and the afterburner control efficiency is 99.7% for hydrocarbon destruction. The kiln has a rated burner capacity of 6.4 mmBTU/hr and the afterburner has a rated capacity of 4.2 mmBTU/hr. The material exit temperature from the kiln is 750-850 °F and the gas temperature going to the afterburner is 250°F. The afterburner has an operating temperature of 1400-1450°F and an exit temperature of 313°F. The afterburner must operate at a temperature greater than 1400°F to destroy organic compounds.

EMISSION AND OPERATING CAPS DESCRIPTION:

None associated with this project. The Source is Synthetic Minor for VOC and PM/PM10.

OPERATIONAL FLEXIBILITY:

None